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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,280	06/15/2005	Viet Nguyen Hoang	BE02 0045 US	7364

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NXP, B.V.
NXP INTELLECTUAL PROPERTY DEPARTMENT
M/S41-SJ
1109 MCKAY DRIVE
SAN JOSE, CA 95131

EXAMINER

NGUYEN, DAO H

ART UNIT	PAPER NUMBER
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2818

MAIL DATE	DELIVERY MODE
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06/08/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/539,280	Applicant(s) NGUYEN HOANG ET AL.	
	Examiner Dao H. Nguyen	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>0605</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to the communications dated 05/16/2005.
Claims 1-10 are active in this application.

Acknowledges

2. Receipt is acknowledged of the following items from the Applicant.
Information Disclosure Statement (IDS) filed on 06/15/2005. The references cited on the PTOL 1449 form have been considered.

Applicant is requested to cite any relevant prior art if being aware on form PTO-1449 in accordance with the guidelines set for in M.P.E.P. 609.

Foreign Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

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4. The specification has been checked to the extent necessary to determine the presence of possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

5. The claim is objected to for the following reason: in claim 1, line 2, the comma “,” after the word “comprising” should be replaced by a colon. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim(s) 1 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, lines 14-15, the limitation “viewed in projection” is not clearly defined and distinctly pointed out the subject matter which is claimed as the Applicant's invention. It is vague of what is “viewed in projection.”

Claim Rejections - 35 U.S.C. § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claim(s) 1-10 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Gutsche et al. (US 6,033,977), in view of Meagley et al. (US 2005/0042874).**

Regarding claim 1, Gutsche discloses a method of manufacturing a semiconductor device, shown in figures 1-6, with a semiconductor body and a substrate 20 and comprising:

at least one semiconductor element 22, the semiconductor device is equipped with at least one connection region "11" (formed in via 11, figs. 5, 6) and

a superjacent strip-shaped connection conductor "9" (formed in opening 9) connected to the connection region "11",

the connection region "11" and the superjacent strip-shaped connection conductor "9" are both recessed in a dielectric 5, and

a dielectric region 12 (figs. 2-4) of a first material (col. 3-5) is provided on the semiconductor body at the location of the connection region "11" to be formed,

the dielectric region 12 is coated with a dielectric layer 5 (fig. 3) of a second material that differs from the first material (col. 3-5),

said dielectric layer 5 is provided, at the location of the strip-shaped connection conductor "9"/"11" to be formed, with a strip-shaped recess 9/11 viewed in projection, overlaps the dielectric region 12 and extends up to said dielectric region 12 (fig. 3),

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and after the formation of the strip-shaped recess 9/11 and the removal of the dielectric region 12 (figs. 4-6),

the connection region "11" is formed by depositing an electroconductive material in a space 11 obtained by the removal of the dielectric region 12 (col. 5, lines 38-47), and

the strip-shaped connection conductor is formed by depositing an electroconductive material in the strip-shaped recess, characterized in that

for the first material 12 use is made of an organic material (see table on col. 5), and

for the second material 5 use is made of a material having a higher decomposition temperature than the organic material (col. 4, lines 15-24).

Gutsche fails to teach that the dielectric region 12 is removed by heating at a temperature above the decomposition temperature of the organic material 12 yet below the decomposition temperature of the second material 5.

Meagley discloses a method of manufacturing a semiconductor device, as shown in figs. 1-2, comprising a first dielectric region 106a which is of organic, and a second dielectric layer 104 being made of a second material having a higher decomposition temperature than the organic material 106a; the dielectric region 106a is removed by heating at a temperature above the decomposition temperature of the organic material

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106a yet below the decomposition temperature of the second material 5 (see paras. [0016-0028].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Gutsche so that the dielectric region 12 of Gutsche would be removed by a thermal decomposition process as that taught by Meagley in order to avoid damaging or removing the dielectric layer 5. See para. [0024 of Meagley.

Regarding claim 2, Gutsche/Meagley discloses the method characterized in that a photoresist is used as the first material 12/15 (Gutsche's col. 3, lines 28-39, and table on col. 5), and

a dielectric resin 5 having a higher decomposition temperature than the photoresist is used as the second material (Gutsche's col. 4, lines 15-51, and table on col. 5).

Regarding claim 3, Gutsche/Meagley discloses the method characterized in that a photoresist is used as the first material, and a liquid glass is used as the second material, said liquid glass is converted to solid glass by heating. See Gutsche's col. 3 lines 28-39; col. 4, lines 15-51, and table on col. 5.

Regarding claim 4, Gutsche/Meagley discloses the method characterized in that the dielectric region is removed during a thermal treatment of the semiconductor body

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wherein the liquid glass is converted to solid glass. See Gutsche's col. 3 lines 28-39; col. 4, lines 15-51, and table on col. 5; see also paras. [0017-0029] of Meagley.

Regarding claim 5, Gutsche/Meagley discloses a method characterized in that the first material as well as the second material are applied in liquid state to the semiconductor body with a centrifuging process. See Gutsche's col. 3 lines 28-39; col. 4, lines 15-51, and table on col. 5.

Regarding claim 6, Gutsche/Meagley discloses the method characterized in that the dielectric region is formed by applying a further dielectric layer above which a mask is provided outside which the further dielectric layer is removed by means of etching, and the dielectric layer, after deposition, is covered with a mask which is provided with an aperture at the location of the recess to be formed, after which the recess is formed by means of etching. See col. 4, line 15 to col. 5, line 38 of Gutsche.

Regarding claim 7, Gutsche/Meagley discloses the characterized in that after removal of the dielectric region and after formation of the recess, yet before deposition of the conductive material, the semiconductor body is cleaned. This is inherent. See also para. [0004] of Meagley.

Regarding claim 8, Gutsche/Meagley discloses the method characterized in that copper is used as the electroconductive material, and prior to the deposition of the

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copper, an electroconductive layer is deposited at the location of the connection region to be formed, said electroconductive layer forms a barrier for copper. See paras. [0013-0014] of Meagley.

Regarding claim 9, Gutsche/Meagley discloses a method characterized in that the electroconductive layer is applied by means of a physical vapor deposition process, and the copper is provided by means of an electroplating process. See paras. [0013-0014] of Meagley.

Regarding claim 10, Gutsche/Meagley discloses the semiconductor device obtained by the method of claim 1. See figs. 1-6 of Gutsche/Meagley and figs. 1-2 of Meagley.

Conclusion

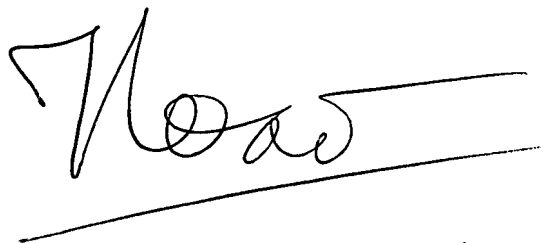
10. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571)272-1907. The fax numbers for all communication(s) is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

A handwritten signature in black ink, appearing to read 'Dao H. Nguyen', is written over a horizontal line.

Dao H. Nguyen
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May 30, 2007